1994 Toxicology Outreach Panel Report

4th Meeting of the Toxicology Information Outreach Panel

National Library of Medicine

Agenda

Call to Order and Introductions	Dr. Bailus Walker, Jr.
Welcome from the NLM Director	Dr. Donald Lindberg
Howard University Training	Dr. Robert Copeland
NIH Grantline	Dr. John James
HBCU File Usage	Ms. Cynthia Gaines
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Introduction

The National Library of Medicine (NLM) established the Toxicology Information Outreach Panel (TIOP) in the summer of 1991 to improve the Historically Black Colleges and Universities' (HBCUs') access to NLM's biomedical information. The TIOP consists of representatives from the Association for Minority Health Professions Schools, the National Association of Equal Opportunity in Higher Education (NAFEO), and the Oak Ridge Institute for Science and Education (ORISE), as well as two consultants and representatives from three government agencies. NLM hosted previous TIOP meetings on August 15, 1991; April 6, 1992; and May 10, 1993. The TIOP was charged with developing strategies that would better enable HBCUs to use the toxicological, environmental, and occupational resources developed by NLM. Additionally at these meetings, plans were established to assess the success of the project thus far and to continue support of the institutions. Recommendations and future directions were also discussed. The fourth TIOP meeting, on June 20, 1994, focused on reports and updates from HBCU representatives and presentations from several prominent leaders in the environmental and public health professions. Additionally, panel members shared success stories and lessons learned during the first three years of the outreach pilot project. The morning sessions were chaired by Dr. Bailus Walker, Jr., Chairman; the afternoon sessions were chaired by Dr. Henry Lewis, III, Texas Southern University.

Opening Remarks

Dr. Bailus Walker, Chairman, called the meeting to order and introduced Kent Smith, Deputy Director, NLM, to the panel. Mr. Smith welcomed the panel members and gave an overview of NLM and the future outlook of the Library. He stated that the panel's initiative to train medical and other health professionals at HBCUs on NLM's toxicological files exhibits dedication and sharing. He said the panel should take pride in what they have accomplished and realize that we have a success on our hands, stating that the panel deserves credit for a great job. He also noted that the Agency for Toxic Substances and Disease Registry (ATSDR) has been a key partner in the success of this project and that this project is a key part of the total NLM goal of outreach. He felt that NLM's outreach programs, given the resources available, had been quite successful and will further benefit from NLM's work with the High Performance Computing Information Infrastructure and the Internet.

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Meeting Topics

Dr. Bailus Walker, Jr.
Chairman, Toxicology Information Outreach Panel
"There are a number of developments that bring into sharp focus the importance of this panel and its activities over the past years in helping institutions and communities in the area of environmental health," stated Dr. Walker. He expressed hope that the members would continue to play an important role in helping the communities understand where to get biomedical and environmental information and how to use it, and charged the panel to work hard toward community education.

Dr. Clarice Gaylord
Director, Office of Environmental Justice, EPA
Dr. Gaylord stressed the importance of "equity", "justice", and "racism" as key words in understanding the issue of environmental equity. She defined "environmental justice" as he fair treatment and meaningful involvement of all people, regardless of race, ethnicity, culture, income, or education level with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. "Fair treatment" means that no population, due to political or economic disempowerment, is forced to shoulder the negative human health and environmental impacts of pollution or other environmental hazards.

Dr. Gaylord pointed out that there is an allegation that the EPA has engaged in unequal environmental protection -- that people of color and low-income populations have been disproportionately exposed to environmental hazards. This has not yet been refuted by the EPA. She explained three reasons why this allegation exists: (1) lack of political clout; (2) lack of economic means, and (3) certain groups of people being unaware of their rights under environmental laws.

An example of this problem can be found in a community in Chicago, Altgeld Gardens, where the EPA had not looked at: (1) cumulative, synergistic effects; (2) constant, continuous, low-level exposures; (3) cross media enforcement; and (4) non-cancer health endpoints. Environmental inequities are not just a site problem, as in the 300,000 farmworkers exposed to pesticide poisoning every year. In some areas, the EPA sets standards based on what's considered an average American. For example, in the area of fish consumption, the EPA determined that eating 6.5 grams of fish per day was safe, yet certain cultures can consume as many as 200 grams of fish per day. By assuming that there is a standard-referenced American, the EPA is not protecting the populations most exposed. Two other problems are high contaminant exposures in urban cities and dumping on American Indian lands.

Dr. Gaylord noted that Executive Order 12898 directs all federal agencies to be aware of the issues of environmental justice when conducting business. The Executive Order has six provisions:

1. Establish an interagency work group
2. Develop strategic and implementation plans
3. Ensure no discrimination in federal programs

4. Conduct health analysis and data collection
5. Analyze fish and wildlife consumption patterns
6. Enhance public parcticipation

At this time, the EPA is divided into eight task forces to accomplish all of the above:

1. Education/awareness/outreach
2. Demographic validation
3. Targeted enforcement
4. Improved health effects
5. Community economic development
6. Integration into agency activities
7. Pollution prevention
8. Workforce diversity

Dr. Vivian Pinn
Director, Office of Research on Women's Health, NIH
Dr. Vivian Pinn introduced the book entitled The Health Status of Women of Color, by Wilhelmina A. Leigh, Joint Center for Political and Economic Studies, which she highly recommended.

The Office of Research on Women's Health was established in September 1990. Since that time the whole focus on women's health and women's health care has mushroomed. The aspect of including women in clinical trials has resulted in the issue of women's health being pushed to the forefront in the media, as well as becoming of concern to the public.

Dr. Pinn spoke of a three-prong mandate at the Office of Research on Women's Health. The first is to determine the research agenda for women's health; the second is to ensure that women are appropriately represented in clinical research funded by the NIH; and the third, and one that she has focused on because it is of special interest, is to ensure that women are included in biomedical careers. She then briefly addressed each of these mandates.

Most of the available statistics on women's health are based on mortality, while there is not a lot of information on morbidity. In addition, more racial breakdown data are available for mortality than for morbidity. The Office does not actually collect data, but rather has been working with the NIH to help increase activities in terms of a better breakdown of morbidity data for women.

Dr. Pinn then mentioned the tracking system, and women as part of a specific research, because there are some new directions in this area. She also discussed the five or six most often quoted reasons why women have been excluded from clinical research. She stated that the business about homogeneous populations goes back to the fact that most clinical research in the past has included mainly a population of white, well-to-do young men, but now the goal is more diversity in terms of gender, as well as race, in these studies.

Legal and ethical issues are certainly of concern also. Dr. Pinn discussed a summary of the policy of the Office of Women's Health Research and pointed out the current changes, referencing a report entitled Women and Health Research/ Institute of Medicine.

The exclusion of women and minorities in clinical studies has not been completely one of malicious intent of male investigators who excluded women and minorities. In fact, since about the late 1970s, policies of protection have been established. Dr. Pinn cited some of the studies that led to the establishment of policies of protection for women, such as DES and the use of thalidomide on pregnant women. She added that the use of DES and the

thalidomide baby studies are not related to clinical research, but in fact were related to the use of these medications in women.

The federal government has established a task force to examine whether to change the existing rules that mandate exclusion of pregnant women and limitation of women of childbearing age from the studies.

Dr. Pinn continued by saying that the Reauthorization Bill for NIH, recently signed by President Clinton, includes a section on inclusion of women and minorities in human subject research. Basically, Dr. Pinn said, it is the same policy that has always been in place, except now it is a matter of public law. The new law reads that human subject research must include women, minorities, and sub populations.

Dr. Pinn then handed out an executive summary of the NIH research agenda, Opportunities for Research on Women's Health, and spoke briefly about it. This report has served as a foundation for their research agenda, helping them to identify gaps in the current knowledge. She stressed that this was only the foundation for an ever-evolving research agenda, because they are learning of more things that affect women that had not even been considered until as recently as 1991 (i.e., chronic fatigue syndrome).

She emphasized that NIH's agenda charges that women's health must be thought of across the lifespan, as opposed to only considering the reproductive system and breasts, and women of childbearing age, and pointed out that knowledge must include when a woman's hormones make a difference and when they do not_not just abnormal hormones, but exogenous hormones, birth control pills, oral contraceptives, and hormone replacement therapy. A much better understanding of the risks and benefits of taking post-menopausal hormone replacement therapy should also be a goal, she added.

Dr. Pinn stated that women's health must be thought of on a genetic and molecular basis, all the way through, adding that she does not think of women's health research just in terms of clinical studies.

One of the special topics being addressed is to ensure that the research includes underrepresented women, especially minority populations. The money for many projects has in the past been used as supplemental funds to recruit more populations of minorities. While they continue to focus on these, they've also now included such populations as lesbians, women who live in rural areas, and women who live in the inner city.

Priority areas where more research is needed have been identified through meetings with those who are involved in research throughout NIH.

Dr. Pinn pointed out that the three leading causes of death for women are the same as those for men. Additionally, the three leading causes of death are the same for most populations, as well as for most racial breakdowns of the population.

Dr. Pinn then discussed the topic "Cancer in Women", noting that breast cancer is still the most common cancer in women. She showed the figures for 1993 and the estimated figures for 1994, which are about the same and are beginning to somewhat stabilize. Other statistics show that lung cancer is overall for women the leading cause of cancer death, except for black women. Breast cancer is still the leading cause of cancer death in black women. For white women, lung cancer has exceeded breast cancer since 1987, and most cases are attributed to smoking

Dr. Pinn briefly discussed the transmission of AIDS in women and what efforts are being made in this area.

She concluded by saying that they have been ordered by Congress to also look at issues of women's health in medical schools, but this is just a starting point. They would like to eventually take this initiative to all professional

health school curriculums, in addition to medical schools.

Dr. Jack Hahn
Extramural Programs, NLM
Dr. Jack Hahn began by giving his professional background and explaining his fascination with networks. He emphasized the amazing revolutionary changes that have taken place in the Internet in the last six months, stating that there are new tools that are not only more powerful, but much easier to use (point and click tools that let you traverse the world, looking at files of data). He stated that in the not-very-distant future the Internet will be as familiar and as much a part of our furniture as television

Dr. Hahn gave an example of a florist in Ann Arbor, Michigan advertising its Flowers by FTD over the Internet, stating that this can be done from home. He described being able to see what the roses and the gift basket looked like.

He emphasized the clarity with which you are able to view images through Internet, and the fact that documents are on the Internet before they are published. Dr Hahn then explained what makes Mosaic wonderful, emphasizing that it is easy to use and that it has links to other databases. He stated that, in his opinion, it is extremely revolutionary.

One of Dr. Hahn's goals is to help small institutions make full use of Internet by using Mosaic. Working with Dr. Melvin Spann and Dr. George Hazard, avenues are being explored to lower the price and get better performance through high-speed activity to the smaller institutions.

In closing, he made the following statement: "And, finally, one thing that came to my mind is, I've seen the Internet and Internet technology as a way of obtaining jobs for minorities. I see the need, a tremendous unfulfilled need for technical people in the area, and I think that we can do it by teaching this in high school and community colleges, replacing, or in addition to skills like automotive mechanics. We do not need differential equations to be a network engineer."

Dr. Tamas Doszkocs
Specialized Information Services, NLM
Dr. Tamas Doszkocs gave a slide presentation on Internet that described its capabilities and use. Questions were asked and answered at the conclusion of Dr. Doszkocs' presentation.

Dr. Barry Johnson
Assistant Administrator, ATSDR
Dr. Barry Johnson began by giving an overview of ATSDR. He then detailed the following four programs, which he thought might be of parcticular note to this audience based on the purposes of this meeting:

1. The Great Lakes Human Health Research Program that ATSDR has undertaken in the Great Lakes Region of the United States
2. Substance-Specific Applied Research Program
3. The Mississippi Delta Project
4. Community Health Education

The Great Lakes Human Health Research Program
In 1990, Congress passed legislation called the Great Lakes Critical Programs Act. That Act expressed the concern of the Congress that there are a number of persistent pollutants in the five Great Lakes -- and a substantial percentage of this nation's population lives in that region. An even greater percentage of the Canadian population lives within the Great Lakes region

Dr. Johnson noted that Congress is aware that a number of the pollutants in the five Great Lakes have, in fact, decreased through vigorous pollution control activities over the years. Congress is further aware that a number of these pollutants, including polychlorinated biphenyls (PCBs) and Mirex, among others, have recently shown patterns of stabilizing and have begun to creep upwards, even though both the United States and Canada appear to have controlled the end-of-pipe pollution problem. There is very good evidence to indicate that the PCBs in parcticular are coming in by way of atmospheric deposition from the southern part of this country, as well as from nations south of the United States. There is also concern that some are coming over the polar ice cap. And, given the size of the Great Lakes, they serve as a magnificent sink for pollutants.

Although pollutant levels have decreased and appear to be stabilizing, mechanisms of pollution are going to be exceedingly hard to control in the future. There is further concern, based on preliminary research, that PCBs and other contaminants, in fact, are getting into the food chain; thus, human exposure is occurring. This information resulted from work at the Michigan Health Department, which has followed the course of PCBs in fish, in breast milk in lactating mothers, and in other parts of the food chain. Dr. Johnson said that essentially two things are being done. Because fish contamination is thought to be the principal route of human exposure in the region, they are looking at exposure characterizations of persons who they think are at the highest risk of exposure to contaminants in fish from the Great Lakes. These populations include Native Americans (especially those on the Mohawk in New York), African Americans, and the urban poor, who are involved in subsistence fishing in Detroit and some of the other Great Lakes metropolitan areas. Amounts of contaminants in the food chain are being measured, as are the amounts of PCBs detected in people.

There has been a significant and very impressive body of research coming out of the area of wildlife biology, Dr. Johnson noted, and much of this has reached the public press. Wildlife populations have decreased in number over the years, and there is some very troubling research that indicates that males of those species are displaying signs of feminization. He added that an impressive body of laboratory research supports these field observations. He also mentioned a series of hypotheses ranging from endocrine disruption to other possibilities

The Board of Scientific Counselors has advised ATSDR, Dr. Johnson stated, to look at two health end points: the human reproductive effects, and neurobehavioral and developmental effects. Several series of studies are ongoing at institutions in the area to look at exposure and at health effects.

He went on to explain how significant findings are communicated to the affected populations; ATSDR has, in fact, been working with state and local health departments and some university networks to begin the communication process.

Substance-Specific Applied Research Program

Dr. Johnson stated that the 1986 amendments to Superfund directed ATSDR, working with EPA and the National Toxicology Program, to examine the hazardous substances of waste sites, determining which have the most significant impact on human health and prioritizing them.

Dr. Johnson noted that they have a list of 275 substances, beginning with lead, followed by arsenic and vinyl chloride. He stressed that this list is prioritized on the basis of implications for human health, frequency at waste sites, and potential for human exposure. He added that for the first 38 substances on that list, 117 key data gaps have been identified. For example, they know that substances that they now get in the groundwater also get into some drinking water supplies.

One key data gap yet to be filled is finding out the health consequence for that health end point. One of the most significant mechanisms for filling those gaps is working with the minority health professional schools through its foundation. He noted that Congress has funded about $4 million a year for these efforts.

Dr. Johnson stated that there are some 13 projects at eight HBCUs helping to fill a number of these key data gaps. These projects are specifically looking at a number of the data gaps in terms of what the data signify for minority populations and persons of color. For example, one project is looking at hypertension in African American, middle-aged men; another project is looking to find out the neurobehavioral effects of a number of metals that migrate from hazardous waste sites.

The Mississippi Delta Project

In 1990, then-Governor Clinton of Arkansas organized a group of seven governors to look at the state of the economy, the state of educational systems, the state of the environment, and the Mississippi Delta, which is considered the spine of this country. The Mississippi Delta consists of 219 counties, beginning at the tip of Illinois (16 counties) and running all the way down to the Gulf. There are seven states in this Delta Region. At that time, ATSDR believed that they had learned some ways to convey toxicological and health information to disadvantaged communities, and that there were other opportunities they needed to undertake more intensely. So, what began as talks in 1991 about a kind of geographically focused project in minority health evolved into the Mississippi Delta Project.

Dr. Johnson provided some background on the region, noting that the Mississippi Delta is arguably the poorest in the nation. It was identified as having serious problems in terms of environmental pollution and as having serious socio-economic problems, as well as shortages in educational systems.

The Mississippi Delta Project will attempt to bring the seven states of the region together with a member of the responsible federal agencies to address the varied problems that exist there. These agencies are: the Centers for Disease Control (CDC); the International Center for Environmental Health; three different parts of EPA, including the Office of Environmental Justice, the Solid Waste and Emergency Response Office, and the Air Programs Office; the National Institute for Environmental Health Sciences (NIEHS); and ATSDR.

In summary, Dr. Johnson said the Mississippi Delta Project will attempt to identify the key environmental hazards in that region. Secondly, it will attempt to reduce the impact of those identified hazards by coordinating federal, state, and community resources. Thirdly, the project will attempt to build an educational infrastructure to support the training and educational needs within that region.

The piece that remains to be added to the project, he noted, is the community's piece. They know that there are communities in that region that are disproportionately impacted by environmental hazards. They are approaching this issue carefully and are working with the states and with the HBCUs to address it.

Community Health Education

Dr. Johnson began discussing this program by noting that the way toxicological information is communicated to communities and to health professionals in those communities is a challenging task, given the kind of work that ATSDR typically does around places of pollution.

As an example of what they're trying to do in the way of community health education, he discussed the issue of the Chattanooga Creek. He stated that his agency and others, working with the EPA region for Atlanta, found that the Chattanooga Creek running through Chattanooga, Tennessee was thoroughly polluted. As EPA began taking actions to identify the sources of pollution, working with the state of Tennessee and with the state of North Carolina, there was a need to tell people, "Don't swim in that creek, don't take fish from that creek, and don't use it for recreational purposes." ATSDR found, through interaction with the community, that children, parcticularly young children, were those at the greatest risk because they used the creek for recreational purposes.

Working with the local health department, EPA and ATSDR designed a program of community education, beginning with elementary school children. Through this kind of outreach and through working actively with local authorities, Dr. Johnson said they were able to bring to the community's attention that there was a serious

problem in terms of contact with that creek.

He noted that an additional challenge to the Agency has been working with the homeless in order to reduce their risk in such a situation. This was accomplished by working with local social programs.

As a closing example, Dr. Johnson detailed a train derailment that occurred about two years ago in the northern part of the United States. A large Burlington Northern Railroad train carrying chemicals managed to run off the trestle and dumped a large amount of some material. A huge cloud enveloped the city and the situation required temporary evacuation of about 25,000 people.

A number of persons, after that cloud abated, began expressing symptoms of respiratory ill health and other kinds of problems. ATSDR was asked by two members of Congress and by the local health department to come in and, in effect, do follow-up actions. Those follow-up actions began with community health education.

Dr. Johnson emphasized that ATSDR must work to communicate the information they know to the public, as well as to health care providers.

In closing, he stated that he thinks that the challenges of this are formidable, and that by working together with the National Library of Medicine, and other institutions, they have hopes of advancing the current abysmal state of knowledge the American public has with regard to toxic substances.

HBCU Update

Howard University

Dr. Robert Taylor

Since last year, two courses conducted jointly with ORISE and NLM were presented with the assistance of Dr. Robert Copeland. There has been one special training course for graduate students in the school of communication and most recently a course conducted in May with 21 parcticipants. This training targeted nurses from HBCUs. In addition, Howard has been very successful in incorporating this training at the graduate level. "As our medical school is going through the accreditation process, the realization of having a biomedical informatics course early in the medical curriculum will add needed strength to our program."

Presently, Howard has four to five graduate students enrolled each semester in a one-hour biomedical informatics course that is required of all graduate students in the department. It's a three-hour laboratory course with the students meeting on a weekly basis to learn how to use computers and access a variety of databases to use for research. This, they feel, provides the foundation and tools needed for research for their other courses throughout their graduate career.

The goal is to provide the National Library of Medicine (NLM) training to every graduate student enrolled in the biomedical sciences, or any graduate student who would like to take it, including diverse fields such as communication disorders, and other areas including engineering. Howard would like to incorporate other divisions in the university in the programs. Over the next four to six months, plans are being developed to have a major training effort which will bring on board more people in pharmacy, engineering, biology, and the other health sciences, so that the program can truly get the mileage and leverage that it deserves.

Finally, avenues are being explored for the development of a separate biomedical informatics lab. This is where students will be able to do essential information management and information searches by accessing the NLM's databases, other databases, Internet, etc.

Dr. Robert Copeland

Dr. Copeland expanded Dr. Taylor's remarks by discussing the NLM training held at their facility on May 17-20. The training was conducted by NLM staff and ORISE staff, including a special visit by a National Cancer Institute representative. The class consisted of 21 nursing professionals from HBCUs who were very appreciative of the training received.

Dr. Copeland also discussed the training held for students in a class for communication disorders in the School of Communication. The training was very successful based on information retrieved from NLM's new database, Health Services/Technology Assessment Research (HSTAR) and the other databases. Dr. Copeland reiterated what Dr. Taylor addressed earlier about starting an NLM training class in the fall for medical students as a fourth year elective and continuing to explore opportunities to make this class mandatory for all first year medical students. It was emphasized by both Dr. Taylor and Dr. Copeland that the opportunities to make the training available in other areas are appropriate, not only campus-wide, but in the hospital for residents, staff, and physicians.

Florida A&M University
Mrs. Pauline Hicks
Mrs. Hicks represented the College of Pharmacy at Florida A & M University. She is the coordinator for information retrieval services and has the responsibility for providing NLM training at her school. Mrs. Hicks informed the panel members of the location of the NLM workstation utilized mainly by graduate students in toxicology. The students are required to do extensive research using the system.

Community outreach that was initially started during the first year of the project continues to grow with training provided for local physicians and other healthcare providers. One area of concern is to enhance healthcare information services in the Gretna community. Mrs. Hicks has accompanied their drug information specialist on several trips to the community to discuss and introduce them to the idea of accessing NLM's databases. Mrs. Hicks concluded her report by discussing space problems they are currently having, but said they remain hopeful that next year they will have a new facility that will physically accommodate and allow greater access to the wealth of information that's available through NLM.

Xavier University
Dr. Ann Barbre
Dr. Barbre updated panel members on the new location of the NLM workstation since their move to the new library during the fall semester. Students can access the system in two different places: the first floor, for the general student body, and the fourth floor, mainly for students enrolled in the College of Pharmacy. Future plans include having an area on the fifth floor of the library dedicated to information retrieval, as well as computer assisted learning and the utilization of other computerized teaching tools.

Dr. Barbre discussed the training by her staff who were initially trained at ORISE. The training is done in small groups and individually, including training for pharmacy students doing part of their clinical rotations in drug information. The students access the system which is maintained at Tulane University Medical Center, where they go for clinical rotations, and other medical centers in the vicinity.

The NLM training component is given to new students who enter the mock research program during the summer before they begin their work on a variety of research programs and the Pharmacy Outreach Program. This is a program that is conducted year round, but intensively in the summer, for about six weeks, to public junior high school students in the New Orleans Metropolitan area. The objective is to develop interest in biomedical careers. The students are exposed to using computers and specifically using them for information retrieval in research.

Dr. Barbre was happy to report that the use of bibliographical retrieval has been incorporated in a large number of courses that are taught university wide. In order to successfully complete the requirements for the course, students have to complete the NLM training and do a project where they are retrieving information on the NLM

system and producing some product as a result of that retrieval. Dr. Barbre mentioned examples of courses which not only included the College of Pharmacy, but other courses such as the Biology Honors Seminar, the Chemistry Honors Seminar, all undergraduate research courses in chemistry, and Nurse Anesthesiology. Dr. Barbre left sample course outlines for Dr. Spann to review. Dr. Barbre also mentioned usage of the NLM system by Dr. Beverly Wright, who teaches a course in sociology which has environmental overtures and is funded through the Office of Environmental Justice at the Environmental Protection Agency. Dr. Barbre concluded that the institutionalization of the NLM training component as part of the required course work has been the main focus since the last meeting.

Meharry Medical College
Dr. Maurice Knuckles

Dr. Knuckles described the training on the NLM system as part of the orientation period for every new student (medical, dental, and graduate) enrolled that occurs one month prior to the start of the school year. They are taught how to access the system and what kind of information can be retrieved. Specific search strategies come later in some of the courses they take. For example, all pharmacology students are required to take a course in toxicology, and the first week or so is spent making sure that they understand how to formulate a decent search strategy for information retrieval. More time is spent on searching the factual databases, such as HSDB and CCRIS, than the bibliographic databases. Dr. Knuckles spends his time making sure that students in the master's program in environmental health have the NLM training.

Future plans include training medical residents, parcticularly in occupational and environmental medicine, and expanding the training to include all resident primary care, such as family medicine, forensic medicine, pediatrics, internal medicine, and general medicine.

Dr. Knuckles cited an example of a real-life situation on the usefulness of the information retrieved on the NLM system by staff members. Sometime in March, one of the buildings was flooded with formaldehyde fumes due to an exhaust fan unit going out. Information on how to diffuse the fumes and properly contain it was retrieved faster than the environmental safety officer could look it up in his book on standards. Other examples on the usefulness of the information retrieval were use of the TRI database by a staff computer specialist to identify industries, and as a resource to categorize the demographics for 219 counties in the Mississippi Delta area. A group on campus called Med. Tech researched the databases to find information on effective therapies/ treatments.

In terms of community outreach over the past year, Dr. Knuckles' staff has responded to 40 to 50 requests for information from member organizations of the Tennessee Environmental Council. In conclusion, Dr. Knuckles added that their training has been primarily with the graduate students and staff members to effectively continue to use the NLM system.

Tuskegee University
Dr. James Webster

Dr. Webster discussed the location of the NLM workstation in the medical library and the hours of its availability. NLM training is available to the students during that time. Regular training during the months of June or January is provided for the third year veterinary students. At the culmination of their training, a paper is submitted for the 353 Veterinary Toxicology Course, and this paper serves as 10% of their grade. The system is also accessed in the Chemistry Department for student usage.

Dr. Webster described a summer program called the Vet Step Program in which 9th, 10th, and 11th graders visit the campus for two weeks, and are provided with hands-on opportunities to search the databases to get the most current information in toxicology. Dr. Webster mentioned that what was most rewarding was that the departments of physiology, pharmacology, and toxicology are making advancements in the development of an environmental veterinary medicine program funded by ATSDR, and having access to the TOXNET databases has allowed them

to proceed to that point. The first two students will graduate specializing in environmental toxicology in May of '95.

Other achievements Dr. Webster mentioned were a new BS degree offered in Environmental Sciences, located in the School of Agriculture and Home Economics, and the development of a Computerized Poisonous Plants Program. Dr. Webster described the process used in putting this program together; it enables one to search for a parcticular plant and have its picture appear on the screen, along with the symptoms or the toxic substance given off by that plant. (Information regarding the symptoms and toxic substances were obtained by searching the NLM system.) Dr. Webster agreed that the NLM system serves as a tremendous asset to their program, especially from the standpoint of veterinary medicine and toxicology.

Drew University of Medicine and Science
Dr. Isaac Reese
The NLM workstation at King-Drew is located in the Medical Sciences library with the following operating hours: 8:00 a.m. - 7:00 p.m. Monday through Friday, and 1:00 p.m. - 5:00 p.m. Saturday and Sunday. An additional workstation is also located in the library with both computers having printers for hard copies. Additional sites from which the databases can be accessed include the library in the Department of Radiology, the Research Office, the office of the residency program coordinator in Internal Medicine, Dr. Reese's office, and a student computer facility that currently houses two computers. King-Drew is currently utilizing four codes. Dr. Reese mentioned that they anticipate completion this summer on additional workstations in all hospital departments involved in teaching interns, medical students, and residents. Training will be extended to all departments when the workstations are in place.

Dr. Reese discussed the training component that is now offered at King-Drew. Introduction to the NLM databases offered each August is now part of Drew's PreMatriculant Reinforcement in Medical Education (PRIME) program for students entering the first year of the Drew/UCLA Medical Student Program. The fourth year medical students receive training as part of a Computers in Medicine course. In addition to the students at King-Drew, students enrolled in the National Science Foundation sponsored Minority High School Student Research Apprentice Program received some introductory training in the use of the databases using materials developed at ORISE. Eleven high school students are anticipated for enrollment this summer.

The faculty, students, and administration are very appreciative of this program and the positive impact that it is having on the institution.

Texas Southern University
Dr. Henry Lewis III
The most significant event at Texas Southern since the panel's last meeting, Dr. Lewis reported, has been the approval by the Statewide Coordinating Board for a Ph.D. Program in Environmental Toxicology, beginning this fall. There were 50 applicants for the first charter class, from which five excellent candidates were selected to enter into the program.

Secondly, through Texas Southern's cooperative interagency agreement with the ATSDR, a Minority Center for Toxicological Research has been implemented. The Toxicology Information Program (TIP) files provide an excellent resource to support the research.

A third project, funded by EPA, is a center for Environmental Toxicology and Assessment. This is a collaborative program between the School of Law and the College of Pharmacy and Health Sciences to develop a mechanism to train community-based citizens in toxicological assessment. A 3-year limitation grant has been applied for which is pending with EPA.

As a parcticipant in the Delta initiative, Texas Southern has submitted to ATSDR a training grant to train pharmacists and the utilized pharmacies in the Delta Region as environmental consultants for the pharmacists

and environmental information centers within the drug stores in that Delta Region. Dr. Lewis indicated that this project is being looked upon very favorably, and hopefully he will be reporting the outcome at the next meeting.

Additional funding provided by the FDA is channeled to a project called CCOP (Campus Community Outreach Project), which initially focused on diabetes and hypertension, but since that time has been expanded to include toxicology information. The project is a motor home that goes to two or three different shopping center sites on Saturdays and Sundays. A team consisting of a physician, a pharmacist, a nurse, and generally two Pharm. D. students are on board treating an average of 125 to 150 patients. Again, the TIP files are an integral part in that information database, and quite a bit of information is being collected.

Another course entitled Drug Information Systems, to be implemented by the fall, allows undergraduate students to receive training on the NLM system.

In closing, Dr. Lewis stated that their association with NLM has been very fruitful, and in his assessment, has spun off Texas Southern's most significant achievement, the Ph.D. Program in Environmental Toxicology.

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Discussion and Conclusion

Dr. Henry Lewis

Dr. Lewis congratulated the panel and the representative institutions for moving into the area of doctoral education at the level of the highest degree. He remarked that "it does my heart good to see an institution that contributes to the education of those who happen to enjoy the joyous admissibility that most of us around the table, and which I enjoy, go for a discipline that will be of the highest degree in academics. It's now long overdue. Congratulations."

Dr. Melvin Spann

Dr. Spann reiterated a question raised earlier by several people as to "Where do we go from here?" -- officially. TIOP began as a one-year project, and this is the fourth meeting. He asked whether it is safe to assume that, at least for the next year (through September of '95), NLM will continue to support at the level to which it has previously supported, to which Kent Smith replied, "Yes".

Conclusion

As evidenced by the reports presented at this fourth TIOP meeting, the NLM efforts have been effective and timely; therefore, the original intent of this project has been achieved. By establishing links with HBCUs, NLM has improved the ability of HBCUs to train medical and other health professionals in the use of NLM's toxicological, environmental, and occupational information resources. The panel members were satisfied by the progress to date, but will continue to look ahead at the work that still needs to be done. They concluded that this meeting had better prepared them to reach solutions in their own educational environments.

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